DOCUMENT RESUME

ED 269 697 CG 019 084

AUTHOR Gattiker, Urs E.; Larwood, Laurie
TITLE Resistance to Change: Reactions to Workplace Computerization.
INSTITUTION Lethbridge Univ. (Alberta).
PUB DATE 86
NOTE 30p.; For related documents, see CG 019 083-085. Paper presented at the Annual Meeting of TIMS/ORSA (Los Angeles, CA, April, 1986).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Computer Literacy; *Computers; *Employee Attitudes; *Job Analysis; Labor Force Development; Motivation; Occupational Aspiration; Organizational Effectiveness; Self Concept; *Work Attitudes; *Work Environment
IDENTIFIERS *Resistance to Change

ABSTRACT

Although past research has suggested that computer acceptance and knowledge are two variables crucial in attaining desired profitability increases with computer-based technology, few studies have examined how these variables occur in organizational settings. A study was undertaken to examine acceptance of, and knowledge about, computer-based technology on the part of end-users. Subjects were 277 employees of 15 California-based organizations who used computers for some work tasks. Subjects represented a range of organization departments, job categories, and locations. Subjects anonymously completed questionnaires designed to assess knowledge, use, and availability of computers in their organizations. Questionnaire sections examined background variables, self-concept and motivation for power and achievement, perceived impact of computers on one's job and future with the company, computer knowledge, computer availability, attitudes toward computers in organizations, and computer usage. The results revealed that job impact was the most important predictor of computer knowledge and acceptance. This finding suggests that with increased perception of job impact, individuals will more likely accept computers and attempt to learn more about computers to secure employment or to retain jobs. Another strong predictor for a person's knowledge about comptuers was actual usage. These results suggest several important considerations not only for research on computer-based technology in organizations, but for human resource management as well. Four pages of references conclude the report. (NB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED269697

RESISTANCE TO CHANGE:

REACTIONS TO WORKPLACE COMPUTERIZATION

Urs E. Gattiker
The University of Lethbridge
Laurie Larwood
The University of Illinois at Chicago

Short Title: Resistance to Change

CG019084

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Urs E. Gattiker

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The authors would like to thank Rosemarie S. Gattiker for her helpful comments on an earlier draft of this paper. Please address comments and requests for reprints to: Urs E. Gattiker, Technology Research Group, School of Management, The University of Lethbridge, Lethbridge, Alberta T1K 3M4 CANADA. Telephone: (403) 320-6966 or 329-2169.

RESISTANCE TO CHANGE:
REACTIONS TO WORKPLACE COMPUTERIZATION

Abstract

The primary purpose of this study was to examine acceptance of, and knowledge about, computer-based technology on the part of end users. Earlier research suggests that computer acceptance and knowledge are two variables crucial in attaining desired profitability increases with such technology. However, few studies have examined how these variables occur in organizational settings. Based on earlier findings, it was hypothesized that an individual's degree of aspiration and motivation for career advancement as well as any perceived negative or positive impact on his/her job would predict computer knowledge and acceptance. The results obtained in this study support these expectations. Their implications for future research and for practitioners in organizations are discussed.

RESISTANCE TO CHANGE:

REACTIONS TO WORKPLACE COMPUTERIZATION

In recent years, considerable interest and attention have been focused on computer-based office information technology and its increasing importance for organizations (cf. Doswell, 1983; McMillen, 1984: Bjorn-Anderson, 1983). The primary efforts of researchers have been to help managers and human resource specialists adapt computer technology to the workplace and to determine the cost effectiveness of the new technology. Several organizational issues, such as investment in computer technology (Mansour & Watson, 1980), strategic planning (Megaw & Lloyd, 1984) and production flow (Carter, 1984), have been researched and discussed quite extensively, however, investigations of human resource aspects remain scarce.

The introduction of computer-based office information technology has usually been technology-driven, without thorough consideration of potentially negative effects upon human resources and the quality of work life (Gattiker, 1984). This approach is forced on management by the fact that the effects of innovation on personnel are often uncertain at the time of its adoption (Kahn, 1981). Nonetheless, while technological advances may seem to provide a competitive edge, the company adopting them will also have to cope with the "growing pains" common to innovators. One such concern is the acceptance of the new technology by the company's employees (Dierkes & Von Thienen, 1984). As some researchers have pointed out, familiarity with the technology and individual willingness to acquire relevant skills are both crucial to the full utilization of technology (Sproull, Kiesler & Zubrow, 1984).

This paper investigates how resistance to computerization might be

overcome through certain work factors, such as usage and availability/access to computer-based technology. Because both employee characteristics such as motivation and perceived job input may explain such resistance to some degree (Lippitt, Langseth & Mossop, 1985) we also look at those variables. Finally, this study will examine the relationship between these phenomena and computer knowledge and acceptance.

Resistance to Change and Computer-Based Office Information Technology

This section reviews the literature covering human resource aspects of computer-based office information technology. As the review will show, most applied research to date has concentrated on computer technology from the organizational perspective, and conceptual papers appear to outnumber empirical research (Megaw & Lloyd, 1984). Furthermore, resistance to change and its influence upon organizational efforts to computerize have been largely ignored (Gattiker, 1984).

In a prescient early observation, Leavitt (1964) suggested that important changes can be brought about in the organization through alteration of its technology. Nonetheless, change risks disturbing the psychological contract or status quo for employees who have learned an earlier set of rules (Larwood, 1984, p.213). Since people generally wish to protect the systems they have found to be successful and want to avoid potentially risky restructuring considerations (cf. Klein, 1966), they can seldom be expected to invite major change.

Technological innovations often require a continuous reorganization process for a firm. New hardware and software developments lead to changes in the use of computer-based information technology in organizational settings (Gattiker, 1984). In a survey of the literature dealing with resistance to computerization, Dierkes and Von Thienen (1984) defined a hypothetical construct called "acceptance of computerization". They suggest-

ed that overcoming employee resistance to changes caused by computerization is facilitated by the overall acceptance of computerization. For their purposes, these authors used the construct of acceptable computerization to measure employee reactions to and perceptions about computers. Unfortunately, empirical research dealing with resistance to change and related psychological states such as acceptance is limited.

The manner in which successful organizations may have overcome resistance to change by their workforce can be partly assessed by looking at psychologcial states. These include but are not limited to individual perceptions and beliefs about the potential impact of such technology upon their employment prospects as well as their career development. For example, Gattiker, Gutek and Berger (1985) studied office workers and found that an individual's belief that computerization may aid his/her advancement could result in higher motivation and more positive attitudes toward computerization.

Knowledge and acceptance have been identified as important constructs to assess resistance to computerization (Gattiker, 1984; Dierkes & Von Thienen, 1984). The term knowledge in this context includes, but is not limited to, the individual's capability to work with computer terminals or intelligent workstations. Acceptance is a psychological construct which tries to measure the employee's positive and/or negative perceptions of the computer-based technology in his/her workplace, as discussed further below.

Knowledge. Computer knowledge has been defined in different ways for specific groups of employees (Bjorn-Anderson, 1983; Wynne, 1983). In the past, researchers tended to assume that such knowledge was related to technical aspects, and was usually exhibited by computer scientists and similar professionals who often knew programming languages. Today's wide use of computer-based technology has brought about a radical change of the

term (Hebenstreit, 1983). In offices, it now describes the worker's capability to use a word-processing or spread-sheet program for certain clerical tasks, such as business correspondence and report writing (Card, Moran & Newell, 1984; Morgall, 1983). Furthermore, computer knowledge may include some familiarity with the data processing capabilities of standard programs, an assumption which is starting to be reflected in the computer education of future managers.

After examining 128 university students, Gattiker, Williams and Paulson (in press) concluded that knowledge about computers affected the individual's effective use of those systems to do assignments. Since a large part of the organizational literature stresses that only the effective use of technology really warrants its huge financial investment, an assessment of computer knowledge may be one important way to achieve effectiveness in managing computer-based office information systems.

The impact of computers on work prospects and job security are widely discussed in the literature. There is no agreement on whether further developments in office technology will help in creating new jobs for workers who find themselves rendered obsolete by it (Gutek, 1983). A person's belief about how much impact computer technology may have on his/her employability could become a driving force in encouraging the individual to improve his/her knowledge about it (Lippit, Langseth & Mossop, 1985, chap. 1). Therefore, knowing their employees' beliefs and possible fears about computerization is of major importance to managers, so that productivity gains may indeed be achieved and the large financial investments justified (Card, Moran & Newell, 1984).

In addition to job impact, a second consideration which may be related to overcoming resistance to changes caused by computerization is need for power, success and affiliation and related self-image (McClelland, 1975).

Workers who seek power generally want to be in control at the workplace, and will try to avoid being controlled by technology. McClelland & Boyatzis (1982) found that a person's high need for power and success in combination with affiliation motivates the individual to take the necessary steps to assure career progress and thus his/her power. Baumeister, Hamilton and Tice (1985) surveyed individuals and their success expectancy. Their data showed that people who have a positive image of themselves tend to perform better under less favorable conditions when compared to those whose self-image is less high. For computerization this means that resistance to change may less likely be expected from an employee with a high need for power, success and affiliation as well as a positive self-image since that individual will face this kind of challenge and probably succeed in making it serve his/her needs (cf. McClelland & Boyatzis, 1982). Therefore, an individual's power needs and motivation for advancement (Bacharach & Lawler, 1982, chap. 3) could be fulfilled through his/her knowledge about computer-based technology which might prove critical to the company's future prospects (Mintzberg, 1983, chap. 12).

A further area of interest is computer use and availability. In their study, Gattiker, Williams and Paulson (in press) found that extensive use of computers significantly increases individual knowledge about the technology (hardware and software). However, the data also allowed the conclusion that easy accessibility does not greatly affect people's knowledge of computers.

Acceptance. This term has been explained in various ways. It could be defined as a person's receptive psychological state based on perceived impact on one's job, skills, career progress, etc. (Gattiker, 1984). Computer acceptance has been identified as crucial to the effective use of computer-based technology (Bikson & Gutek, 1983), although research about such acceptance has been limited (Gattiker, 1984). Indeed, until recently

researchers have failed to relate acceptance to effectiveness (Dierkes & Von Thienen, 1984). To expand our knowledge about the acceptance of computer-based technology and its major determinants in organizational settings, employee beliefs and attitudes toward the new technology should be assessed (McMillen, 1984; Rice, 1984), because acceptance of computers in one's work environment will enhance job performance (Carter, 1984).

An employee may have a computer easily available and might make heavy use of it, but his/her attitude toward the technology could be negative nonetheless, resulting in poor acceptance (Gattiker, Gutek & Berger, 1985). For instance, peers and supervisors who do not accept the computer for their work and avoid using it may have an equally negative influence upon their co-workers. In their theory about rational bias, Larwood, Gutek and Gattiker (1984) suggested that attitudes of others can influence one's own.

A person's aspiration and motivation for career advancement is another important factor which might facilitate his/her acceptance of the technology (Mey, 1981). Any assumed impact of computers on employee job prospects could also explain why an individual may accept the technology. The perceived neccessity of learning new computer-related skills to remain employable may help workers overcome resistance to change, leading to a higher acceptance of the new technology. This self-defense mechanism has been investigated and described in numerous organizational development studies (e.g., Lippitt, Langseth & Mossop, 1985, chap. 2), however, studies of its practical application concerning office computerization are virtually non-existent.

Gattiker, Williams and Paulson (in press) found that neither easy access to, nor extensive usage of, computers will actually improve their acceptance by individuals. Although these authors concluded that usage would affect an individual's knowledge about computers, the same did not

apply for acceptance. Nevertheless, it would be of considerable interest to see if these results can be replicated since Gattiker, Williams and Paulson (in press) used a Canadian sample.

Summary and Conclusion

We believe that studies about people's psychological states and their effects upon computer knowledge and acceptance constitute an important area of organizational research (e.g., Megaw & Lloyd, 1984). Resistance to computerization may offset many of the benefits defined in the decision-making process which first led to the adoption of the technology (Carter, 1984). Nonetheless, applied research in organizational settings is scarce (Gattiker, 1984). However, such resistance and its relationship to a person's self-image, need for power and achievement as well as usage and availability of computers and their perceived job impact by employees has been identified as an issue of concern.

Research Issues

The present study examined computer knowledge and acceptance with the following predictors: use of the technology, aspiration and motivation, job impact and availability of the technology at the workplace.

The expectations to be tested here are that positive correlations exist between the predictor variables and knowledge about and acceptance of computers. For example, those having higher aspiration, greater availability and more usage, and who perceive a greater job impact, will have a higher degree of familiarity with computers.

The following hypotheses were established:

Hypothesis 1. In agreement with the literature previously cited, job impact, aspiration and motivation will explain a significant part of the population variance and correlate positively with individual acceptance of computers.

Hypothesis 2. Job impact as well as aspiration and motivation will predict a significant part of the population variance and correlate positively with individual knowledge about computers.

Judging by previous organizational research, the most valuable predictor for knowledge or acceptance of computer-based technology has not been found yet (Gattiker, Williams & Paulson, in press; Gattiker, 1984). Therefore, an attempt was made in this research project to determine which predictor in the above-mentioned set of variables would explain the largest part of the variance in an employee's knowledge about computer-based technology.

Method

Fifteen organizations, whose names were taken at random from the Los Angeles Times annual roster of California's largest companies, were invited to participate in a study to determine the ways in which people use computers in their daily work. All organizations participating in this study were providing computers (main-frame, word processors and personal computers as well as CAD) for some work tasks. However, in this sample of employees supposedly using them regularly, only about 75% were in fact performing part of their assignments with the help of computer-based technology.

The organizations were asked to distribute the surveys randomly across different departments, job categories and locations. Out of 335 individuals, 277 (82.7%) returned their surveys directly to the researchers. The sample consisted of 136 men and 141 women, with the average age being 31 years. All participants had at least some high school; 86% held high school diplomas while almost half (49%) also had done some college work, with 28% having completed undergraduate degrees. Graduate degrees were held by 9% of the sample. Average tenure with the organization was 3.6 years. The title "manager" was claimed by 23%.

Instrument

Respondents were asked to complete an anonymous questionnaire designed to assess knowledge, usage and availability of computers in their organizations. The survey instrument was divided into seven segments, with the first asking about background variables, such as age, education, organizational tenure and level in organization. Except for background, each section used five-point scales. The second portion of the questionnaire was concerned with self-concept and motivation for power and achievement. The third segment asked about the perceived impact of computers upon the respondent's job and future with the company. Fourth, survey participants were questioned about their knowledge of computers, especially the technical aspects concerning computer languages, data processing and word-processing. The fifth part of the questionnaire asked respondents about the availability of computer-based office information technology in their organization, and the sixth section covered the attitudes of employees, supervisors, subordinates and peers toward computers in organizational settings. Finally, the survey inquired about computer usage. The anchors used for the different segments of the questionnaire are included in the tables to be presented below.[1]

Dependent Variables

A reliability analysis was conducted with the items expected to measure computer knowledge and acceptance. To decide on the number of items in either of the above two scales, item-total and item-item correlations were taken into consideration when making additions to, and deletions from, those scales. Only items with item-total and item-item correlations of >.30 were considered (Nunnally, 1978, chap. 6). The scales were constructed by averaging scores from the items to be included on each dimension.

Independent Variables

The items measuring motivation and aspiration were first analyzed by means of a factor analysis. Orthogonal varimax rotations were performed and eigenvalues (>1.0) were used to determine the number of factors to be extracted (Kaiser, 1974). Only items with loadings greater than .30 were statistically significant ($p<.001$), according to the Burt-Banks criterion (Child, 1970). Furthermore, item-total and item-item correlations (>.30) were again used to further decide about an inclusion of an item on the scales (Cattell, 1966; Kaiser, 1974; Nunnally, 1978, chap. 6). Scales were constructed by averaging scores from those items which loaded higher than .40 on each factor and whose item-total and item-item correlations were >.30. This conservative approach was used to avoid reporting results based on sample characteristics which could not be repeated with other data in the future (cf. Nunnally, 1978, chap. 3 & 6; Webb, Campbell, Schwartz, Sechrest & Grove, 1981, chap. 3). The same approach was used to obtain scales for job impact, usage and availability respectively.

Scale item means were then used in multiple regression to determine how much of the population variance in knowledge and acceptance of computers could be explained by the independent variables. For correct application, multiple regression assumes that the residuals are normally distributed (bivariate and multivariate normal distribution). To test this assumption, the data used in each of the regression runs were tested for data outliers, first by looking at standardized residuals, and second by evaluating a histogram of the standardized residual plots. An analysis of these two procedures as well as the normal probability plots of the standardized residuals showed that the data collected met the normal distribution assumption.

Results

Computer Knowledge and Acceptance

Of the original five items measuring acceptance and the 12 items measuring general knowledge about computers, reliability analyses were conducted as described above. The same analytical procedure was used for obtaining the scales assessing usage and availability of computers in the organization. As Table 1 and 2 show, the reliability coefficients for acceptance as well as knowledge are well above .70 which has been suggested by Nunnally (1978, p. 245) as a desirable minimum reliability for constructs in the early stages of formulation.

Insert Tables 1 & 2 about here

Factors in employee motivation and aspiration. Of the original 13 items, all were retained to define the three factors which were labelled as follows: (1) self-image; (2) power; and (3) success and affiliation. All items and factors are described in Table 3.

Insert Table 3 about here

Using the procedure described earlier, Cronbach's coefficient alpha was calculated as an index of internal consistency for each of the three factors. The reliability coefficients ranged from .58 to .83 which puts them above the desirable minimum level in two out of the three cases.

Acceptance of Computers

Hypothesis 1 predicted that the given scale job impact, aspiration and motivation would explain a significant part of the population variance in acceptance of computers. As mentioned before, multiple regression assumes that the residuals are normally distributed (bivariate and multivariate normal distribtion) which was tested using the procedure described earlier; the results showed that this assumption was met.

The variables measuring computer usage were entered by themselves to obtain their unique contribution $\underline{R}^2$. Separate multiple regression runs were done on the data to get the unique contribution $\underline{R}^2$ of job impact, aspiration and motivation, and availability of computers.

The job impact scale by itself accounts for a significant amount of the population variance when predicting an individual's acceptance of computers (see Table 4). The same is true for the factors aspiration and motivation. Usage was also tested, however, the adjusted $\underline{R}^2$ was 0. Within the predictor factors, we examined Pearson's $\underline{r}$ to determine the direction of the predictor's contribution, as suggested by Cohen and Cohen (1983, chap. 3). Job impact correlated positively ($\underline{p}<.001$, by a two-tail test of Pearson's $\underline{r}$) with acceptance of computers. One interpretation may be that a respondent who perceives computer-based technology as having a greater positive impact on his/her job (e.g., to simplify tasks) is more likely to accept such technology in the work environment. Furthermore, the two subscales of aspiration and motivation, i.e., power and success/affiliation, each correlated positively ($\underline{p}<.001$, by a two-tail test of Pearson's $\underline{r}$) with acceptance of computers; perhaps an individual striving for power and success as well as affiliation will more easily accept computer-based technology than someone who does not have such aspirations. Based on these results, Hypothesis 1 seems confirmed.

Insert Table 4 about here

As Table 4 shows, job impact by itself accounts for nearly the same amount of the population variance explained in computer acceptance as do all other predictors combined (cumulative adjusted $\underline{R}^2 = .17$ [$\underline{p}<.001$]). Availability by itself does not account for any significant part of the population variance explained in acceptance of computers, while job impact was clearly the best single predictor.

Knowledge About Computers

Hypothesis 2 stated that job impact as well as aspiration and motivation would account for a significant part of the population variance explained when predicting computer knowledge. Once more, the data met the normal distribution assumption described earlier. Table 5 summarizes the results obtained in this part of the study. The same regression procedures as previously described were applied. Except for availability, all independent variables account for a significant part of the population variance when predicting knowledge about computers.

Insert Table 5 about here

Again, to determine the direction of each predictor's contribution, Pearson's r was examined. Usage correlates positively ($p<.001$, by a two-tail test of Pearson's r) with knowledge, suggesting that the higher a person's use of computer-based technology at the workplace, the more knowledge he/she has about computers. At the same time, the positive correlation of job impact with computer knowledge ($p<.001$, by a two-tail test of Pearson's r) shows that the more potential impact the person perceives from computer technology on the job (e.g., simplification or potential elimination), the more likely he/she possesses some computer knowledge. Two out of three possible factors in motivation and aspiration, namely power and success/affiliation, correlated positively with knowledge of computers ($p<.001$, by a two-tail test of Pearson's r). Apparently, an individual who is motivated to seek power and be successful in an organization and also values affiliation with co-workers, is more likely to have a considerable degree of knowledge about computers.

Table 5 also shows that usage as well as job impact are the strongest predictors of computer knowledge, while aspiration and motivation did not add significantly, as shown in the cumulative R^2. Overall, the results as

listed in Table 5 support Hypothesis 2.

Discussion

The primary purpose of this study was to examine acceptance of, and knowledge about, computer-based technology on the part of end users. These dimensions are likely to affect productivity and absenteeism (Kahn, 1981), and they have been identified as crucial when determining the effective use of computer technology in organizations (e.g., Carter, 1984).

As the present data reveal, at least one dimension can be isolated (i.e., job impact) which predicts a significant part of the population variance in computer knowledge and acceptance. With increased perception of job impact, individuals will more likely accept computers and attempt to advance their knowledge about them to secure gainful employment and/or retain their positions. Media coverage, not only about jobs threatened by elimination but also opportunities created by new computer technologies, their additive effects are important in this context. Apparently, if technological developments at work are combined with such media attention, on accepting and learning more about computer-based technologies are supported.

Another strong predictor for a person's knowledge about computers is actual usage, which does not come as a suprise. However, it has been reported that mere usage of a technology may not lead to greater knowledge about it (Gutek, 1983). This could be explained by differences in actual computer tasks where programming may be seen as creative and preferable to endless hours of data entry at a terminal (cf. Mankin, Bikson & Gutek, 1982). One reason for the present results could be that in all of the participating organizations computer-technology had been used by managers as well as support personnel for at least three years prior to completing our survey. The fact that the respondents in this sample represented many

companies and several organizational levels adds to the strength of these results.

We also observe a most interesting phenomenon in that motivation and aspiration do not predict a substantial part of the population variance in either computer knowledge or acceptance. Several authors have identified acceptance and knowledge about computer-based office technology as being crucial to a company's future (Dierkes & Von Thienen, 1984; Pava, 1983, chap. 8). Therefore, a person's influence and power could be expected to increase if his/her knowledge about computers is substantial (Bacharach & Lawler, 1982, chap. 3; Mintzberg, 1983, chap. 12). Following McClelland's (1975) reasoning, successful managers or individuals with a good self-image as well as high aspirations for success and power should be highly motivated to acquire such knowledge if they do not already possess it. Moreover, these people would probably accept computer-based technology as a new opportunity to advance their own purposes and goals. Surprisingly, the study at hand does not confirm such belief and opinions; rather it weakens or even refutes them. This is highly intriguing when considering the fact that the large employers surveyed here have at least been forerunners of such technology adaptation, if not actual inventors (hi-tech companies). Their environments could thus be expected to nurture such relationships, if they do indeed exist.

The most important contribution of this study is its help in defining those determinants of computer knowledge and acceptance which have been identified by some organizational researchers as being most crucial for organizational survival today (e.g., Pava, 1983, chap. 8). With job impact being the most important predictor, a person's prospects for gainful employment are aided by a survival instinct of sorts. At the same time, the actual usage of computer-based technology predicts its knowledge to a

substantial degree. These results support previous research with business students which also confirmed that usage predicted an individual's knowledge significantly (Gattiker, Williams & Paulson, in press). Socialization processes as well as dependence upon others and their work performed with computer technology may also facilitate or even force such outcomes.

Implications for Future Research and Management

These results represent several important considerations not only for research on computer-based technology in organizations and but also for human resource management. The likelihood of achieving a high effectiveness in using such technologies in any organization is reduced if the strongest explanatory dimensions of knowledge and acceptance are not further identified (cf. Mansour & Watson, 1980). This research project would benefit by a complementary study with increased focus on individual motivation and aspiration, and their influence upon computer knowledge and acceptance. A more extensive questionnaire should be designed for such an investigation. Our data confirm that automatic assumptions and pragmatic statements about what affects computer knowledge and acceptance are not always substantiated and should be avoided (e.g., Morgall, 1983; Pava, 1983). Instead, we ought to continue the study of these phenomena in organizational settings before informing the public about potential effects.

Clearly, it is to any organization's benefit to inform its employees about changes in computer-based technology and anticipated impacts upon their skills, work structure and job prospects within the company. Human resource specialists should counteract all technology 'myths' by encouraging their employees to increase their computer knowledge, which may in turn affect computer acceptance by eliminating any prevalent fears. As discovered here, perceived job impact has a substantial influence upon an individ-

ual's acceptance of computer-based technology.

For managers, prevailing employee perceptions about computer-based technology provide an important and readily available source of information for the decision-making process. It may not be possible to use a participative approach when introducing computer-based technology to an organization or work unit, but a dialogue with the workers directly affected may facilitate management's goals and desired profitability gains. Furthermore, employees should be encouraged to use computer-based technology extensively in their work whenever possible and effective. As a result, their knowledge will improve which in turn can lead to a more effective use of the technology on future assignments (e.g., Gattiker, Williams & Paulson, in press).

Finally, these results suggest that organizational researchers should continue to investigate the issues of computer knowledge and acceptance as well as their predictors. All constructs ought to be improved with the addition of new items so that reliability and face validity can be increased. Additional dimensions, such as organizational commitment, stress, perception of technology and career success, might also have to be included (Gattiker, 1984). Human resource specialists should know more about their employees' computer-related feelings and beliefs. Only then will it be possible to place a worker most effectively and utilize computer-technology in a way which rewards the organization for being innovative. The findings of this research project will assist in this process.

Footnotes

[1] Due to space limitations, the actual wordings of all items and scaling are not included here. They are available from the authors upon request.

References

Bacharach, S. B., & Lawler, E. J. (1982). Power and politics in organizations. San Francisco: Jossey-Bass.

Baumeister, R. F., Hamilton, J. C., & Tice, D. M. (1985). Public versus private expectancy of success: Confidence booster or performance pressure? Journal of Personality and Social Psychology, 48, 1147-1457.

Bikson, T., & Gutek, B. A. (1983). Advanced office systems: An empirical look at utilization and satisfaction. In X. X. Furst (Ed.), Proceedings of the National Computer Conference, 52, 319-328. Arlington, VA: AFIPS Press.

Bjorn-Anderson, N. (1983). The changing roles of secretaries and clerks. In H. J. Otway and M. Peltu (Eds.), New office technology (pp. 120-137). Norwood, NJ: Ablex Publishing.

Card, S. K, Moran, T. P., & Newell, A. (1984). The psychology of human-computer interaction. Hillsdale, NJ: Lawrence Erlbaum.

Carter, N. M. (1984). Computerization as a predominate technology: Its influence on the structure of newspaper organizations. Academy of Management Journal, 27, 247-270.

Cattell, R. B. (1966). The scree test for the number of factors. Multivariate Behavioral Research, 1, 245-276.

Child, D. (1970). The essentials of factor analysis. New York: Holt, Rinehart & Winston.

Cohen, J., & Cohen, P. (1983). Applied multiple regression/correlation analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Dierkes, M., & Von Thienen, V. (1984). Kein Ende der Akzeptanzschwierigkeiten moderner Technik? Zum Zusammenhang der informationstechn-

ischen Entwicklung und ihrer Akzeptanz. (Report No. P84-2). Berlin, West Germany: Science Center Berlin.

Doswell, A. (1983). Office automation. New York: John Wiley & Sons.

Gattiker, U. E. (1984). Managing computer-based office information technology: A process model for management. In H. W. Hendrick and O. Brown, Jr. (Eds.), Human factors in organizational design (pp. 395-403). Amsterdam, The Netherlands: North-Holland.

Gattiker, U. E., Williams, R. M. J., & Paulson, D. (in press). Effectiveness of teaching methods: Computer literacy of businesss graduates. Human Factors in Organizational Design, Vol 2. Amsterdam, The Nederlands: North-Holland.

Gattiker, U. E., Gutek, B. A., & Berger, D. E. (1985, August). Perceptions of office technology by employees. In R. Kling (Chair), Computerization in workplaces. Symposium conducted at the 79th annual meeting of the American Sociological Association, Washington, DC.

Gutek, B. A. (1983). Women's work in the office of the future. In J. Zimmerman (Ed.), The technological woman (pp. 201-215). New York: Praeger.

Hebenstreit, J. (1983). Training for future office skills. In H. J. Otway, & Peltu, M. (Eds.), New office technology (pp. 205-220). Norwood, NJ: Ablex Publishing.

Kahn, R.L. (1981). Work and health: Some psychosocial effects of advanced technology. In B. Gardell and G. Johansson (Eds.), Working life (pp. 17-37)

Kaiser, H. F. (1974). An index of factorial simplicity. Psychometrika, 39, 31-36.

Klein, D. (1966). Some notes on the dynamics of resistance to change: The defender role. Concepts for social change. Cooperative Projects for

Educational Development Series, 1. Washington, DC: National Training Laboratories.

Larwood, L. (1984). Organizational behavior and management. Boston, MA: Kent Publishing.

Larwood, L., Gutek, B., & Gattiker, U. E. (1984). Perspectives on institutional discrimination and resistance to change. Group & Organization Studies, 9, 333-352.

Leavitt, H. (1964). New perspectives in organizational research. New York: John Wiley.

Lippitt, G. L., Langseth, P., & Mossop, J. (1985). Implementing organizational change. San Francisco: Jossey Bass.

Mankin, D., Bikson, T. K., & Gutek, B. A. (1982). The office of the future: Alternatives and choices. The Futurist, 16, 33-37.

Mansour, A. H., & Watson, H. J. (1980). The determinants of computer based information system performance. Academy of Management Journal, 23, 521-533.

McClelland, D. C. (1975). Power: The inner experience. New York: Wiley.

McClelland, D. C., & Boyatzis, R. E. (1982). Leadership motive pattern and long-term success in management. Journal of Applied Psychology, 67, 737-743.

McMillen, S. (1984). Office automation: A local government perspective. Public Administration Review, 12(1), 64-67.

Megaw, E. D., & Lloyd, E. J. (Eds.) (1984). Human-computer interaction. A special issue of Ergonomics Abstracts, 16(1).

Mey, H. (1981). Mikroelektronik--Moeglichkeiten, Gefahren und Grenzen. Wirtschaftsbulletin, 30. Zurich: Zuercher Kantonalbank.

Mintzberg, H. (1983). Power in and around organizations. Englewood Cliffs, NJ: Prentice-Hall.

Morgall, J. (1983). Typing our way to freedom. Is it true that new office technology can liberate women? Behaviour and Information Technology, 2, 215-226.

Nunnally, J. C. (1978). Psychometric theory (2nd ed.). New York: McGraw-Hill.

Pava, C. (1983). Managing new office technology. New York: Free Press.

Rice, R. E. (1984). Mediated group communication. In R. E. Rice and Associates (Eds.), The new media (pp. 129-156). Beverly Hills, CA: Sage.

Sproull, L. S., Kiesler, S., & Zubrow, D. (1984). Encountering an alien culture. Journal of Social Issues, 40, 31-48.

Webb, E. J., Campbell, D. T., Schwartz, R. D., Sechrest, L., & Grove, J. B. (1981). Nonreactive measures in the social sciences (2nd ed.). Boston: Houghton Mifflin.

Wynne, B. (1983). The changing roles of managers. In H. J. Otway and M. Peltu (Eds.), New office technology (pp. 138-151). Norwood, NJ: Ablex Publishing.

Table 1

Items Used to Define Two Scales: Computer Knowledge and Acceptance

Scale	Items	Cronbach's Alpha
Acceptance	In general, how do	
	people at your org. react to computers people you report to react to computers people in the level below yours react to computers people at your level react to computers you react to computers	.79
	all scaled from 1 (actively accept them) to 5 (actively reject them)	
Knowledge	Knowledge, comfort concerning	
		.73
General	computers in general computer languages data processing word processing	
	all scaled from 1 (know very much) to 5 (know very little)	
Comfort	computers in general computer languages data processing word processing	
	all scaled from 1 (very comfortable) to 5 (very uncomfortable)	
Learning	computers in general computer languages data processing word processing	
	all scaled from 1 (intend to learn more) to 5 (no intent to learn more)	

Note. The above scales were obtained by running a reliability analysis. Item-total and item-item correlations as well as face validity were taken into consideration when making additions to, and deletions from, the scales.

Table 2

Items Used to Define Two Scales: Usage and Availability of Computers

Scale	Items	Cronbach's Alpha
Usage	How often do you	
	use a computer or computer-based information in your job	.88
	personally use a computer or a terminal in your job	
	prepare reports at a computer to be used or evaluated by others	
	use a computer to obtain information not available to others in order to perform you own job	
	--all scaled from 1 (very often) to 5 (very seldom)	
Availability	In general, how much does your organization	
	provide access to computers	.83
	provide computer assistance	
	--all scaled from 1 (not enough) to 5 (too much)	

Note. The above scales were obtained by running a reliability analysis. Item-total and item-item correlations as well as face validity were taken into consideration when making additions to, and deletions from, the scales.

Table 3

Items Used to Define Three Factors: Self-Image, Power and Success/Affiliation

Factor	Cronbach's Alpha	Items	Factor Loadings
1 Self-Image		How strongly would you say you are motivated to	
	.58	play it safe	.63
		avoid emotionality	.72
		stay cool	.69
2 Power			
	.83	achieve power	.77
		get to the top	.66
		control others	.85
		be the first	.68
		take charge	.70
3 Success and Affiliation	.79	achieve success	.65
		be accepted by others	.63
		maintain self-control	.77
		do a good job	.85
		have close friendships	.64

Note. The above factors were obtained using principal components analysis. Orthogonal varimax rotations were performed on the data. Only loadings greater than .30 were statistically significant ($p<.001$), according to the Burt-Banks criterion (Child, 1970).

Table 4

Acceptance of Computers: R^2 Accounted for by Each Predictor Set

Predictor Set[a]	# of Variables in Set	R^2
Usage	1	.00
Job Impact	1	.16****
Aspiration & Motivation	3	.07***
Availability	1	.00
Cumulative R^2 (df = 277,9)		.17***

Note. R^2 is an estimate of the population R^2 adjusted for the number of predictors (Cohen & Cohen, 1983, pp. 105-107) with the multiple regression values actually obtained. The unique contribution R^2 of usage, job impact, aspiration & motivation, social background and availability was obtained with separate regression runs. To get the cumulative R^2, all predictor variables were entered together in the regression at the same step/time.

[a]Aspiration & motivation represent the factors self-image, power and success/affiliation. Job impact and availability indicate the scales obtained.

***p<.001; ****p.<0001

Table 5

Knowledge of Computers: Unique R^2 Accounted for by Each Predictor Set

Predictor Set[a]	# of Variables in Set	R^2
Usage	1	.15****
Job Impact	1	.12****
Aspiration & Motivation	3	.07****
Availability	1	.00
Cumulative R^2	(df = 277,9)	.27****

Note: R^2 is an estimate of the population R^2 adjusted for the number of predictors (Cohen & Cohen, 1983, pp. 105-107) with the multiple regression values actually obtained. The unique contribution R^2 of usage, job impact, aspiration & motivation, social background and availability was obtained with separate regression runs. To get the cumulative R^2, all predictor variables were entered together in the regression at the same step/time.

[a]Aspiration & motivation represent the factors self-image, power and success/affiliation. Usage, job impact and availability indicate the scales obtained.

***p<.001; ****p<.0001